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Berlin, May 2006

Opinions expressed in this paper are those of the author and do not necessarily reflect views of the institute.

IMPRESSUM

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Contents

Abstract

In this study we first analyze duties on passenger cars in 27 European countries. Taxes and fees related to the registration, ownership and use of cars are assessed differently across Europe, and their rates vary significantly. We find that the annual taxes levied on specific types of cars differ across countries by a factor of up to four, while the various kinds of duties levied account for extremely diverse shares of the entire car-related tax burden and give rise to very different ratios of fixed and variable components in the taxes levied.

Given the importance of taxation systems for market and competitive conditions, the European Commission is seeking to achieve reciprocal alignment of the various systems. The Commission has also proposed that greater importance be given to environmental criteria in the assessment of vehicle related taxes. Effectively in some countries, the registration taxes represent a significant burden on the acquisition of new vehicles; this factor reduces market transparency and may mean that taxes are levied twice. Only in a few countries' tax schemes is fuel consumption taken into account, and then only to a marginal degree. It is thus necessary to modify and simplify the tax systems in Europe, because it is crucial that the traffic sector contribute more to climate protection, and because motor vehicles impair local air quality. In this context, the overall structure of the various charges to passenger cars should be rebalanced, with CO_2 emissions not being the sole focus.

1 Types of taxes and assessment bases

Vehicle traffic is a key source of tax revenue for European countries. Depending on tax rates, the number of vehicles on the road and vehicle usage, the generated taxes compare to up to 5% of the gross national product by way of registration charges, various ongoing owner fees, petroleum tax and turnover tax.[1] Since the differences between the tax systems are so pronounced an international summary of the components encumbering motor vehicles is required so as to obtain a uniform informational basis for many issues of transportation, environmental and competition policy.

This study examines tax systems in the 25 member states of the EU as well as in Switzerland and Norway.[2] In principle taxes on vehicles in European countries can take the following forms:

- Non-recurrent payment in connection with the purchase and registration of vehicles (turnover tax, registration tax, registration fees),
- Periodically charged taxes on the ownership or tenure of vehicles (vehicle tax, insurance tax) or
- Usage-dependent charges (petroleum tax, turnover tax).[3]

When *a new passenger vehicle is purchased and first registered,* non-recurrent taxes are to be paid in all countries (Table 1). As a minimum, this charge consists of the turnover tax, which in almost all countries is based on the net invoice price, while in four countries the net price plus the respective registration tax serve as the basis for calculating the turnover tax. Only in Sweden is the turnover tax the sole charge at this stage. In eight countries, vehicle owners additionally only pay moderate fees; in the other 18 states, a tax is due when the vehicle is first registered, in nine of them there is an additional registration fee.

Overall, there are at least ten different bases for assessing registration taxes, which moreover can be combined in various ways.[4] Most often the purchase price of the vehicle and the cubic

[1] Cf. OECD Revenue Statistics 2005 Edition, Paris.

[2] Dominika Kalinowska, Hartmut Kuhfeld, Uwe Kunert and Oliver Rülicke: The charges made to motor vehicles in Europe in 2005. Report by commission of the German Federal Ministry of Finance, Berlin 2005.

[3] This does not include use-dependent fees (tolls, parking costs) since they can be avoided by the vehicles' owners.

capacity are important factors; in addition the type of drive train, engine output, age and weight of the vehicle as well as safety equipment are also taken into account. Among the 18 countries which levy a registration tax, eight directly include ecological aspects in their tax assessment bases by considering the aspects of exhaust emissions of criteria pollutants or fuel consumption. In two countries the registration tax is differently assessed depending on the region in which it is levied.

In eleven countries, the registration tax is an ad-valorem tax which is levied either on the net price or the gross price. In the countries which levy ad-valorem taxes, technical characteristics of the vehicle additionally impact the tax amount levied. In seven states this charge is designed as a unit tax – in other words, it is directly related to technical characteristics. In extreme cases, the registration charge allocated to a year may amount to approximately 3,000 Euros for a standard-size automobile.[5] Additionally, in 17 countries an administrative fee of up to 170 Euros is charged.

The owner of a passenger vehicle registered to be driven is to pay *recurrent taxes* in almost all of the countries regarded here. Only Estonia, Lithuania and Poland levy no vehicle tax at all for passenger vehicles, while in France, the Czech Republic and Slovakia, it is solely the private owners are not taxed.

For vehicle taxes levied on passenger cars – which is always a unit tax – there are eight assessment bases in European countries which are combined in a variety of ways.[6] Most often the type of drive train and the cubic capacity are drawn on, in which context gasoline and diesel engines are often differently taxed. Furthermore, the weight of the vehicle is important; only very few countries have made the engine output or the age of the vehicle part of their tax assessment basis. Six countries have regionally differentiated vehicle taxes. Lower fuel consumption and modern exhaust systems are honored by the vehicle tax schemes of eleven countries. For a standard-size vehicle, the annual vehicle tax amounts to up to 600 Euros.

In addition, taxes are to be paid on liability insurance premiums in 20 of the states investigated here: the tax rates may amount to more than 40 % of the premiums and in some countries are increased even more, by tax-like charges. Thus, the charge may amount to up to

[4] In four countries the technical characteristics (engine rating) of the vehicles are converted in order to generate a modified assessment base (i.e fiscal horsepower).

[5] This corresponds to a one-time tax charge of 15,000 Euros at registration.

three-fifths of the insurance premium (Table 1). Seen in a European context, only cars from Estonia and Poland remain free of any periodic charge.

The *taxes directly connected with the usage of vehicles* are comprised of petroleum tax, miscellaneous other minor charges on petroleum and turnover tax (Table 2). In the 25 EU countries, the tax rate for super gasoline currently hovers between 0.28 Euros and 0.69 Euros per liter, for diesel fuel it is between 0.24 Euros and 0.69 Euros. Tax rates fall into this range in Switzerland and Norway as well. In addition to petroleum taxes, turnover tax is charged with rates of 7.6 % (CH) to 25 % (DK, H, N, S) on the product price including the petroleum tax (Table 1). Given the current price levels for unleaded Eurosuper gasoline of 0.85 Euros to 1.42 Euros per liter, the charges total 46 % to 67 %. The gas station prices for diesel fuel are at 0.84 Euros to 1.37 Euros; the share of the total charges in this price amounts to 41 % to 65 % (Figure 1).

2 Charges incurred for a reference vehicle

In the statistics released by the *Kraftfahrt-Bundesamt* (German Federal Bureau of Motor Vehicles and Drivers), the market for passenger vehicles in Germany is broken down into ten segments. Of these, the segment "lower medium" is the most significant, with close to one million new registrations annually, which is more than a quarter of the car market. In the European Union as a whole, this market segment even makes up one third. In Germany, the car model most often registered in this segment both for vehicles with gasoline engines and diesel engines is the VW Golf, which is why it was taken as the basis for the calculations presented below.

We calculate the average annual charges for new, privately owned vehicles which accrue for the first owner during the ownership period.[7] In this context, it was assumed that the vehicle remains in the possession of the initial owner for four years.[8] The non-recurrent charges levied when the vehicle is purchased and registered are allocated, on a pro-rata basis, to the first

[6] In four countries, the result of the "engine rating" is additionally considered in assessing vehicle tax.

[7] Tax exemptions limited in time, as currently granted in Germany, among other countries, according to the *Kraftfahrzeugsteueränderungsgesetz* (German Law Modifying the Motor Vehicle Tax) of 1997, for Euro-4 vehicles and for "3 liter cars", are not considered here. These tax exemptions ended on December 31st, 2005.

four years in accordance with the estimated value depreciation.[9] The price differentials for new vehicles across the various countries were taken into consideration in calculating the turnover tax and registration tax.[10]

3 Passenger cars with gasoline engines

In determining the charges incurred, vehicle information and some assumptions were included in the calculation.[11] Considering the variation of average annual mileage of cars in Europe and given the facts that new cars as well as bigger cars are driven considerably more we assume an annual mileage of 15,000 km per year. Thus, for a passenger vehicle of the lower medium size with gasoline engine, in the first four years of usage, a range of annual charges in the 27 countries ensues that starts at 720 Euros in Luxemburg and reaches 3,700 Euros in Denmark. For the seven countries making up the top of the list for charges incurred, the registration tax plays a noticeable role (Table 3 and Figure 2). In Malta it comprises half and in Denmark almost 60 % of the total charges. In fact, it is the registration tax that, of all tax components, exhibits the greatest variations between the countries. In contrast, the range in which turnover taxes are charged on vehicles purchased (7.6 % to 25 %) is a much lesser factor where the differences in the overall charges incurred are concerned.

For passenger vehicles belonging to private owners, the annual vehicle tax also varies significantly: In six countries no vehicle tax is charged at all, while in the other countries amounts up to 430 Euros are to be paid for the reference vehicle. The insurance taxes also vary drastically – however, the amounts (except in France and Lithuania) are always less than the vehicle tax. The petroleum tax, as it results from the annual mileage of 15,000 kilometers as assumed here, is the highest charge in 20 countries. The charge ranges from280 Euros (Latvia) to 700 Euros (Great Britain). Lastly, the turnover tax on fuel forms the sixth charge compo-

[8] A good four years pass on average prior to the first change of ownership of a privately owned passenger car in Germany; cf. *Kraftfahrt-Bundesamt* (German Federal Bureau of Motor Vehicles and Drivers), *Statistische Mitteilungen* (Statistical Bulletin), volume 1, issue 7, 1999.

[9] Should a registration or transfer tax also be charged for further changes of ownership, then the complete charge is allocated to the initial owner in the present study's statistical calculations. Recurring registration or licensing fees are allocated to the first owner.

[10] Cf. the regular price determinations provided by the European Commission: *www.europa.eu.int/comm/competition/car_sector/price_diffs/.*

nent; in more than two thirds of the countries – given the assumptions made here – its importance is greater than that of the vehicle tax. This applies for the majority of countries even if the annual mileage is reduced to 10,000 kilometers.

In analyzing the ranking for the 27 countries (Figure 2), there is a broad middle range comprised of approximately half of the countries of Europe, in which the total tax charge is somewhere between 1,000 Euros and 1,500 Euros. Great Britain leads this group as a result of its high petroleum tax. For the countries in which taxes are even higher, the registration tax is the decisive factor. Note that the seven countries with a sizeable car production (D, F, E, GB, B, I, S) are all in this middle range resulting from no or small registration charges and thus relatively low total taxation given the respective income levels.

For the charges levied on vehicle purchase and vehicle ownership, Germany is in the lower range, ranking behind Luxemburg and Switzerland as the other two western European countries. In contrast, the German charges for fuel consumption are matched only by three countries (Denmark, Norway and Finland) and exceeded by two (Great Britain and the Netherlands). When the total charges incurred are ranked, Germany is in the middle range: In this calculation, twelve countries charge lower taxes, while 14 countries have higher charges, some of them considerably higher.

Seven of the ten new EU member states rank in the lower third with the total taxes they charge. Surprisingly Slovenia (due to the registration tax) and Hungary (because of the turnover tax, vehicle and petroleum tax) are included in the group of countries with higher taxes even though no adjustments for income levels or purchasing power parities were made.

The differences of the results between the countries are dependent on the assumed usage intensity and type of car considered. If the analysis is expanded to include multiple vehicle segments, while continuing to assume the same annual mileage (15,000 kilometers), the ranking of the countries is hardly altered.[12] It is noteworthy that Germany's relative position in terms of taxes becomes more and more advantageous with increasing vehicle size: while

[11] These are: technical vehicle information, average fuel consumption, country-specific net purchase price, amount of the insurance premium, value depreciation over four years after initial registration, fuel prices, annual mileage, and more.

[12] In the study upon which this report is based, 22 passenger car models from all vehicle segments were considered.

Germany ranks in the middle of all the countries in the "mini" segment, the tax amount for a vehicle of the luxury class is lower only in seven countries.

4 Passenger cars with diesel drive

Because of its great significance for the transport industry, diesel fuel is taxed at a lower rate than carburetor fuel in all the countries considered here, except Switzerland and Great Britain. In many countries, the tax advantage thus granted to users of passenger vehicles with diesel engines is compensated to some extent by a higher vehicle tax as compared to the tax levied on vehicles with gasoline engines. For a lower medium size diesel car, the vehicle tax to be paid, as compared to a comparable passenger car with gasoline engine, is higher in 15 of the 27 countries and lower in 2 countries.[13] Thus, the tax advantage in fixed costs enjoyed by those purchasing cars with a gasoline engine is considerable; it can amount to up to 500 Euros annually in this vehicle class (Table 4 and Figure 2).

On the other hand, due to higher petroleum tax rates and the higher fuel consumption of vehicles with gasoline engines, the petroleum tax and turnover tax that are to be paid on fuel purchased are always higher than those for diesel vehicles. Given the annual mileage of 15,000 kilometers assumed here, the petroleum tax alone for vehicles with gasoline engines is twice as high as that levied on diesel vehicles in more than half of the countries; the difference amounts from 150 Euros to 400 Euros in these countries.

The calculation of the sum of all types of charges shows a higher burden (of up to more than 300 Euros) for vehicles with gasoline engines in the majority of the 27 countries. Only in seven countries are the charges for passenger cars with diesel engines higher than for those with gasoline engines.

However, the evaluation depends on the assumed intensity with which the vehicles are used, since the fixed and variable charges vary from country to country. The differences in the variable charges and costs among countries do affect how much cars are driven. Furthermore, within a country the lower variable costs bring about that diesels are on average driven more

[13] Comparisons of this sort are restricted by the fact that even in identical automobile bodies there are no identical gasoline-diesel equivalents in the technical characteristics. In addition, the ranking of some countries in terms of charges is not decisively influenced by the type of drive, but instead by registration and vehicle taxes resulting from differences in the cubic capacity or in the engine output. Where the vehicle body and engine output are

than gasoline cars.[14] Given a realistic spectrum of mileage, ranging from 10,000 to 20,000 kilometers, the diesel vehicle comes out worse throughout in six countries and generally better in 18 countries (Figure 3).[15] Due to the diesel vehicle's lower fuel consumption, the relative position in terms of taxes improves with increasing mileage in all the countries. This tendency is all the more pronounced the greater the difference is between the specific charges levied on carburetor fuels and diesel fuels. Since in Great Britain and Switzerland the specific charges levied on diesel fuel are not lower than for gasoline, the differences are particularly small here. In Germany as well, the charges incurred for diesel passenger cars are lower starting from a mileage of 10,000 kilometers for the selected vehicles (Golf gasoline engine 1.4 and Golf diesel engine 2.0). But this analysis only indicates break-even points for the taxation part of costs in the countries. The lower kilometer specific costs for diesels are compensated in total tax burden by two factors: Consumers choose to drive diesels more miles per year than gasoline cars and consumers that drive much tend to choose diesel cars.

In all countries, diesel models are more economical in tax terms than petrol-run models as car size decreases and mileage increases. Small and medium-class cars with a diesel engine are subject to lower taxes in most countries – over a wide range of mileage – than comparable cars with a petrol engine. Accordingly, there is a tendency towards greater proliferation of diesel drives in countries in which the diesel vehicle comes out more profitably in terms of charges incurred as compared to a gasoline engine (Figure 4).[16]

5 Reform efforts for charges on passenger cars

The most recent initiatives of the European Commission concerning the taxes levied on vehicles specifically address the restructuring of tax systems for passenger cars and the tax rates

concerned, the selected VW Golf models are identical, but their engine volumes strongly differ from one another. For the diesel variant, the price to be paid for a new vehicle is 10 % higher.

[14] Currently the average annual mileage of cars in Germany is estimated at 11 300 respectively 20 400 Kilometer for gasoline and diesel cars.

[15] In Cyprus, registration and vehicle taxes are levied according to cubic capacity in a steep progression, so that the extremely discrepant position of comparable vehicles is not a result of the type of drive train, but rather the difference in engine volume.

[16] For a detailed analysis of the development of the diesel passenger cars' characteristics, their market conditions and their significance for the markets in five European countries, cf. L. Schipper, C. Marie-Lilliu and L. Fulton: Diesels in Europe – Analysis of Characteristics, Usage Patterns, Energy Savings and CO_2 Emission Implications, Journal of Transport Economics and Policy, Vol. 36, 2002, Part 2; as well as Kalinowska et al., loc cit..

applied to fuels.[17] Those measures target an existing fleet of more than 210 million passenger vehicles in the 25 EU member states and a new sales market with an annual volume of approximately 15 million cars. The Directive proposal submitted by the Commission for taxing passenger cars pursues three objectives:

- To abolish registration taxes within a ten-year period.
- To create a system, immediately, by which registration and vehicle taxes paid are reimbursed when the vehicle is brought to another country.
- To assess taxes – at least partially – on the basis of carbon dioxide emissions.

Adopting this proposal would mean that the member states would have to significantly restructure their systems for taxing passenger cars. The large discrepancies in the charges incurred, especially the national particularities inherent in the registration tax, contribute to car prices before taxes still varying drastically within Europe, despite the fact that the systems for sale and distribution of vehicles have been liberalized.[18] In countries with a low registration tax or none whatsoever, the automobile industry demands a significantly higher price for new cars before taxes than it does in other countries.[19].

Thus, the Commission is correct – passenger car taxation systems as diverse as those found within the member states of the European Union result in tax impediments (reduced market transparency and disadvantages for citizens relocating from one country to the other since they are taxed twice), distortions (i.e. the vehicle trade in high-price countries is limited) and inefficiencies (i.e. the industry is unable to make use of economies of scale because markets are artificially fragmented as a result of the discrepant tax structures). In addition, excessively

[17] Proposals on harmonizing and restructuring the taxation of passenger cars were provided in the Communication COM (2002) 431 final version of September 6th, 2002 (http://europa.eu.int/eur-lex/en/com/cnc/2002/com2002_0431en01.pdf), and after having consulted players on the market, a Directive on passenger car related taxes COM(2005) 261 final version dated July 5th, 2005 (http://europa.eu.int/comm/environment/co2/pdf/taxation_com_2005_261.pdf) was submitted as a proposal.

[18] The altered distribution laws are contained in the new Automotive Block Exemption Regulation: Regulation (EC) No. 1400/2002 of the Commission dated July 31st, 2002, Official Journal of the EC. L 203/30 of August 1st, 2002 and http://www .europa.eu.int/comm/competition/car_sector/.

[19] For evidence as to the significance that variances in taxation have for the differences in net sales prices of passenger cars in the EU states cf. H. Degryse and F. Verboven: Car Price Differentials in the European Union: An Economic Analysis. Brussels 2000 (http://europa. eu.int/comm/competition/car_sector/distribution/eval_ reg_1475_95/ studies/car price differentials.pdf). In addition, the exchange rates play a key role and serve to explain short-term fluctuations of price differences. Taxes and exchange rates cannot, however, completely explain price differences and their development in the time period from 1993 to 2000, which is the subject of this analysis.

high charges which exclusively affect new vehicles delay the modernization of the existing fleet.[20]

The goal of abolishing registration tax entirely, or to a great extent, can only be achieved over a longer period of time, since the system can only be progressively restructured. This is the case in particular for those countries generating significant tax revenue from this source. Furthermore, the price decline for older vehicles – which, when they were purchased, were subject to higher registration tax – has to be cushioned for the consumers. On the other hand, the proposed reimbursement of taxes levied on passenger cars in order to protect consumers against being taxed twice does not appear to be the most urgent matter, since few tax subjects are impacted and this project would result in additional bureaucratic expenditures (for example by the need to establish a standardised method to determine the remaining value of the vehicles). It seems that the Commission has made this proposal based on the concept that, in the not improbable event that its first objective is not achieved – the abolishment of the registration tax – at least the double taxation should be dealt with.

The third and, from an ecological perspective, most paramount objective of the Directive proposal is to partially or fundamentally restructure the tax system to which passenger cars are subject, giving it CO_2 related assessment bases. Thus far, the countries investigated have developed various strategies to take environmental repercussions into consideration when levying taxes. One assessment basis which takes into account the adverse impacts that passenger cars have on the environment is, to quote but one example, the aspect of whether cars comply with pollution emission limits before they go into effect (Euro2/3/4) – a provision that exists in Germany and in the Netherlands.[21]

In order to decrease average consumption and thus attempting to reduce the CO_2 emissions of the transport sector, some countries have made fuel consumption and CO_2 emissions their new assessment bases. Among the 17 EU countries that have registration taxes, three also consider the emissions of the cars, and five countries have included fuel consumption in their

[20] The renewal rate for passenger cars (new registrations as compared to existing fleet) amounted to an average of 7.7% in 2001 in the EU-25. Almost all countries levying higher registration taxes exhibit lower replacement rates (i.e. Denmark 5.1 %); the few countries in which this is not the case have above-average growth rates where motorization is concerned, starting from a below-average level (i.e. Ireland, the Netherlands); cf. Eurostat: Energy, transport and environment indicators. Luxemburg 2004.

[21] For the type approval of vehicles, EU Directives have established exhaust threshold values that must be complied with; these have been significantly reduced over time in accordance with the technologically realizable

taxation systems. In ten EU states, environmental aspects play a role in assessing the vehicle tax; six of them take fuel consumption or CO_2 emissions into account, six consider the emissions of the cars. But in almost all cases the consumption components are only a minor factor in the tax assessment scheme.[22]

From an ecological perspective, the introduction of components for vehicle and registration taxes that unequivocally deal with CO_2 emissions is definitely prudent, especially since tax measures form a pillar of the Community's strategy to reduce CO_2 emissions of passenger cars[23]. This strategy was already introduced in 1995 and needs to be more emphatically pursued, in the opinion of the EU Commission.[24]

Orienting taxes on CO_2 emissions (in grams per kilometer) will give diesel vehicles an advantage, as a result of their more efficient engines. Thus far, the tax advantages presented above have already contributed to diesel motors gaining in market share as vehicle drive trains throughout Europe. A crucial factor here is that as a result of the petroleum tax, CO_2 exhaust from diesel fuel is implicitly taxed at a lower rate than gasoline is.[25] There are no good reasons for preferential treatment of this kind – at least not in the private sector – since although the diesel drive train has the advantage where CO_2 emissions are concerned, there are considerable downsides given by the emissions of other pollutants such as particulate matter and nitrogen oxide.[26]

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standards. The emitted quantities of carbon monoxide, carbon hydroxide, nitrogen oxide and particles are restricted (measured in grams per kilometer).

[22] A more apparent spreading of fuel consumption is displayed in Austria as regards its registration charge and in Denmark as regards the annual vehicle tax.

[23] Cf A Community Strategy to Reduce CO_2 Emissions from Passenger Cars and Improve Fuel Economy. Communication from the Commission to the Council and the European Parliament. COM (95) 689 final version, December 20th,1995 and Bull. 12–1995, Clause 1.3.146.

[24] Cf. Hartmut Kuhfeld and Uwe Kunert: Mileage of motor vehicles in 2004 higher than ever before. In: DIW Berlin Weekly Report No. 37/2005, with comments on the conclusions drawn by the Commission after reviewing the effectiveness of the strategy

[25] Diesel fuel has a CO_2 exhaust per liter that is 13 % higher than with gasoline. With the current rates of petroleum tax in Germany, the charges for gasoline amount to approximately 281 and for diesel fuel 178 Euros per ton of CO_2.

[26] According to the Euro exhaust norms thus far and those anticipated in the future for passenger cars (vehicle class M1), emission limits for carbon hydroxide and nitrogen oxide are higher for diesel engines than for gasoline drives, the permissible emissions of carbon monoxide are lower and the emitted particle quantities need to be limited only for diesel drives. Cf. Preliminary draft proposal for a Regulation of the European Parliament and of the Council relating to emissions of atmospheric pollutants from motor vehicles (Euro 5) (http://europa.eu.int/comm/enterprise/automotive/ index_en.htm).

6 Conclusions and policy alternatives

The systems existing in Europe by which taxes are levied on passenger cars are very discrepant. This is demonstrated by the diverse types of charges as well as by the multitude of assessment bases and tax scales. This means that considerable differences result where the amounts charged are concerned, and that the ratios of fixed and variable tax components for passenger cars vary greatly from one country to the next.

In light of the competitive and ecological impacts of these tax systems and their heterogeneity, efforts are called for to bring the tax systems more in line with one another. However, the restructuring that the European Commission is demanding will be difficult and will require longer adjustment periods because the respective selection of assessment bases are the result of divergent tax-policy objectives and fiscal framework conditions.

The proposal to consider fuel consumption increasingly as a basis for assessing taxes is a step down the right path, towards providing fiscal incentives for reducing the fuel consumption in larger automobile market segments and thus towards a more efficient use of energy. However, this will mean that the overall structure of the various effective charges levied on passenger cars will also need to be rebalanced, in which context the focus should not be on CO_2 emissions alone. Once the new EU requirements for air quality enter into force in 2010, diesel engines' higher exhaust values for other criteria pollutants could mean, in turn, that immission limits are again being exceeded in a way that creates local air quality problems.[27] Furthermore, taking into account the implicitly reduced CO_2 taxation of diesel fuel discussed above, the consumer's tax for gasoline and diesel fuels for passenger cars should also be brought in line with one another, which would mean that a demand brought forward by the Commission earlier can now be met.[28] With the new Energy Tax Directive, this path is opened to the member states without the national haulage sector being burdened.[29]

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[27] According to a framework law akin to the one for particulate matter applicable since January 2005, starting in 2010 requirements concerning the concentration of nitrogen oxide will have to be complied with; Council's Directive 96/62/ EC dated September 27th, 1996 on ambient air quality assessment and management (Official Journal of the EC. EC No. L 296 p. 55).

[28] A prerequisite for this would be that diesel fuel used for private or for commercial purposes be separately taxed, cf. in this context also the Commission proposal for a Council directive to introduce special tax arrangements for diesel fuel used for commercial purposes and the convergence of consumer taxes on gasoline and diesel fuels, COM (2002) 410 final, dated July 24th, 2002. This proposal was, however, rejected by the European Parliament.

[29] According to Article 7 of the Directive, member states may differentiate between commercially and not commercially used diesel fuel in levying taxes; cf. Directive 2003/96/EC of October 27th, 2003 on restructuring the

Ecological objectives can be pursued on the one hand by bringing in line with one another the petroleum taxes charged in individual countries on the different types of fuel, and on the other hand, the design of the annual vehicle taxes can support them also. Nevertheless, the steering effect that vehicle taxes may have, as a result of the amount of the tax charged and the spread of its scales, should not be overestimated.[30] In Germany, the current vehicle tax levied represents a share of all charges of between 10 and 30 %, depending on the vehicle; measured by the total costs of the passenger car, this is 2 to 10 %. In other countries too the relevance of the vehicle tax is in this range. Not until the registration tax is changed to a vehicle tax would the vehicle tax palpably gain in weight in countries where a higher registration tax is levied.

As a general rule, however, giving the tax scale too large a spread on a CO_2 base will be problematic, because only new vehicle buyers can react adequately with their vehicle choice. For the existing vehicle fleet, the steering effect represented by expedited scrapping or by the export of high-emission vehicles, is only marginal. Used vehicles are primarily owned by strata of the population that cannot easily access the new vehicles market.[31] The logical consequence would be to introduce a tax scale dependent on CO_2 emissions for the annual car tax of newly registered vehicles only.[32] Moreover, several authors argue that consumer preferences and thus the market value of future fuel savings may be small because of imperfections in the market for fuel economy and thus an additional instrument aimed at influencing the

community framework for the taxation of energy products and electricity; as well as the monthly report 1.2004 published by the German Federal Ministry of Finances: The new energy tax directive.

[30] In preparing the Commission's proposal, the potential that fiscal measures have for reducing the CO_2 emissions of new passenger cars was investigated. The study emphasizes that the objectives set by the Commission would not be attained, in spite of taxes in a significant amount being levied in a considerable range and clearly relating to CO_2 emissions, if this is not accompanied by vehicles' sizes being reduced and the share of diesel passenger cars being increased. Cf. COWI: Fiscal Measures to Reduce CO_2-Emission from New Passenger Cars, January 2002 (www.europa.eu.int/comm/taxation_ customs/resources/documents/co2_cars_study_25-02-2002.pdf).

[31] The information available for Germany shows a clear connection between the household income and the age of existing passenger cars; Cf. www.mid2002.de.

[32] In addition, this approach is in line with the objective since the Community Strategy to reduce CO_2 emissions from passenger cars and the connected commitments made by the automobile industry target the consumption of newly registered passenger vehicles. Communication of the Commission COM(95) 689 final version, Brussels.

The Coalition Agreement of November 11th, 2005 signed by the partners to the German government reveals that the legislative body, in turn, plans to grant tax benefits to those who fulfill EU exhaust norms applicable in the future (Euro5) as early as now. Both components involved in restructuring the motor vehicle tax assessment could be correlated to each other in 2006.

vehicle purchase decision may correct this distortion.[33] One of such instruments proposed in the literature is a system of rebates for high fuel economy vehicles combined with fees levied on lower fuel economy vehicles, known as "feebates". Such policy instrument may not contradict the Commissions target to abolish registration taxes, as it can be designed to be revenue neutral. Studies by Greene (2005), Koopman (1995) and others showed that feebates produce significant reductions of fuel use per kilometer for new cars and that the overwhelming long-run response to feebates is the adoption of fuel economy technologies.[34] Thus used supplementary to restructured vehicle taxes feebates may increase the incentive to improve fuel economy continuously as suitable technologies are available. The restructured taxation systems in different European countries should send similar price signals to vehicle producers and consumers. However, some diversity in the detailed design of the instruments used seems preferable to test different approaches at a regional level and encourage innovation.

[33] For a discussion of the imperfections in the market for fuel economy and of the feebate mechanism see Greene, D.L., Patterson P.D., Singh, M. and Li, J. (2005) Feebates, rebates and gas-guzzler taxes: a study of incentives for increased fuel economy, in: Energy Policy 33, 757-775.

[34] Koopman, G.J. (1995) Policies to reduce CO_2 emissions from cars in Europe: a partial equilibrium analysis. Journal of Transport Economics and Policy 30 (1), 53–70; Davis, W.B., Levine, M.D., Train, K., Duleep, K.G.(1995) Effects of Feebates on Vehicle Fuel Economy, Carbon Dioxide Emissions, and Consumer Surplus, DOE/PO-0031. Office of Policy, US Department of Energy, Washington, DC, February.

Table 1

Taxes levied in Europe on the purchase, registration, ownership and usage of passenger vehicles

	Internat. country codes	Turnover tax %	Registration tax (R)	Registration fee (RF)	Vehicle tax (V)	Insurance tax in %	Parafiscal charges on insurance premiums in % or Euros	Petroleum tax (P)
Austria	A	20	R	RF	V	11	-	P
Belgium	B	21	R	RF	V	9.25	17.85	P
Switzerland	CH	7.6	-	RF	V	5	-	P
Cyprus	CY	15	R	RF	V	5	0.58 Euro	P
Czech Republic	CZ	19	-	RF	V	-	-	P
Germany	D	16	-	RF	V	16	-	P
Denmark	DK	25	R	RF	V	42.9	14	P
Spain	E	16	R	RF	V	6	3.3	P
Estonia	EST	18	-	RF	-	-	-	P
France	F	19.6	R	-	V	18	15.1	P
Finland	FIN	22	R	-	V	22	7.5	P
Great Britain	GB	17.5	-	RF	V	17.5	-	P
Greece	GR	19	R	-	V	10	10.4	P
Hungary	H	25	R	-	V	-	1	P
Italy	I	20	R	RF	V	12.5	12.85	P
Ireland	IRL	21	R	-	V	2	1 Euro	P
Luxemburg	L	15	-	RF	V	4	-	P
Lithuania	LT	18	-	RF	-	15	-	P
Latvia	LV	18	R	RF	V	-	-	P
Malta	M	18	R	-	V	10	-	P
Norway	N	25	R	-	V	-	-	P
The Netherlands	NL	19	R	RF	V	7	-	P
Portugal	P	19	R	RF	V	9	3.757	P
Poland	PL	21	R	RF	-	-	-	P
Sweden	S	25	-	-	V	-	-	P
Slovakia	SK	19	-	RF	V	-	-	P
Slovenia	SLO	20	R	-	V	6.5	-	P

Sources: ACEA (Association des Constructeurs Européens d'Automobiles, European Automobile Manufacturers Association); BMF (Bundesministerium der Finanzen, German Federal Ministry of Finance); CEA (Comité européen des assurances, The European Federation of National Insurance Associations); EU Commission; IRF (International Road Federation).

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Table 2

Fuel prices and charges on fuels in European countries

	Consumer prices including customs duties and taxes		Petroleum tax		Turnover tax
	Eurosuper	Diesel	Eurosuper	Diesel	
	In Euro per liter				In %
Austria	1.100	1.000	0.417	0.302	20
Belgium	1.290	1.050	0.564	0.333	21
Switzerland	1.020	1.090	0.471	0.489	7.6
Cyprus	0.920	0.890	0.305	0.249	15
Czech Republic	1.000	0.990	0.400	0.336	19
Germany	1.290	1.120	0.655	0.470	16
Denmark	1.280	1.070	0.541	0.367	25
Spain	1.030	0.940	0.396	0.294	16
Estonia	0.860	0.840	0.288	0.245	18
France	1.220	1.070	0.589	0.417	19.6
Finland	1.290	0.990	0.581	0.316	22
Great Britain	1.320	1.370	0.687	0.687	17.5
Greece	0.950	0.930	0.296	0.245	19
Hungary	1.130	1.090	0.423	0.348	25
Italy	1.260	1.150	0.564	0.413	20
Ireland	1.070	1.060	0.443	0.368	21
Luxemburg	1.090	0.900	0.442	0.265	15
Lithuania	0.880	0.860	0.287	0.245	18
Latvia	0.850	0.840	0.276	0.236	18
Malta	0.890	0.850	0.310	0.246	18
Norway	1.390	1.260	0.527	0.383	25
The Netherlands	1.420	1.080	0.668	0.365	19
Portugal	1.220	0.980	0.533	0.314	19
Poland	1.050	0.960	0.387	0.292	21
Sweden	1.260	1.120	0.531	0.390	25
Slovakia	1.010	1.010	0.401	0.375	19
Slovenia	0.960	0.940	0.377	0.321	20

Status: August 2005.

Sources: BMF (Bundesministerium der Finanzen, German Federal Ministery of Finance); EU Commission.

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Table 3

Charges on private cars in European countries:
Golf 1.4 with petrol engine[1]
In Euro/Year

	Total charges	of these:					
		Registration charges[2]	Turnover tax on purchase price[2]	Vehicle tax	Charges on insurance premium	Petroleum tax	Turnover tax on petroleum
Austria	1 385	172	370	205	26	425	187
Belgium	1 446	23	372	183	64	575	228
Switzerland	958	43	136	213	12	480	73
Cyprus	941	225	209	59	13	311	122
Czech Republic	911	7	333	0	0	408	163
Germany	1 274	6	286	94	38	668	181
Denmark	3 784	2 149	349	338	134	552	261
Spain	1 031	134	269	57	22	404	145
Estonia	740	26	287	0	0	294	134
France	1 259	33	344	0	78	601	204
Finland	1 765	425	331	128	52	593	237
Great Britain	1 461	23	313	182	41	701	201
Greece	1 165	189	299	168	48	306	155
Hungary	1 417	36	452	264	2	431	231
Italy	1 425	76	358	142	60	575	214
Ireland	2 365	1 061	365	292	6	452	189
Luxemburg	932	7	269	51	9	451	145
Lithuania	761	3	293	0	35	293	137
Latvia	904	106	306	78	0	282	132
Malta	1 863	1 012	280	93	23	316	138
Norway	3 138	1 245	758	314	0	538	284
The Netherlands	2 311	609	340	432	16	681	231
Portugal	1 790	499	454	48	30	544	216
Poland	1 066	104	374	0	0	395	193
Sweden	1 350	0	407	144	0	542	257
Slovakia	927	13	340	0	0	409	164
Slovenia	1 361	382	347	68	15	385	163

Status: August 2005.

1 Assumption: annual mileage of 15,000 km, consumption of 6.8 l/100 km.

2 Pro-rata on one year calculated from registration taxes and charges.

Sources: ACEA (Association des Constructeurs Européens d'Automobiles, European Automobile Manufacturers Association); ADAC (Allgemeiner Deutscher Automobil-Club e.V., General German Automobile Club); BMF (Bundesministerium der Finanzen, German Federal Ministry of Finance); CEA (Comité européen des assurances, The European Federation of National Insurance Associations); EU Commission; IRF (International Road Federation); calculations done by DIW Berlin.

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Table 4

Charges on private cars in European countries:
Golf 2.0 SDI with diesel engine[1]
In Euro/Year

	Total charges	of these:					
		Registration charges[2]	Turnover tax on purchase price[2]	Vehicle tax	Charges on insurance premium	Petroleum tax	Turnover tax on petroleum
Austria	1 089	120	359	205	32	240	133
Belgium	1 421	132	372	429	79	265	145
Switzerland	868	43	136	225	15	389	61
Cyprus	1 854	1 138	209	200	16	198	92
Czech Republic	733	7	333	0	0	267	126
Germany	1 140	6	286	304	47	374	123
Denmark	3 655	2 246	349	432	166	292	170
Spain	891	134	269	123	27	234	103
Estonia	609	26	287	0	0	195	102
France	944	33	344	0	97	332	139
Finland	1 544	458	331	298	64	251	142
Great Britain	1 263	23	313	167	51	546	162
Greece	1 677	630	299	372	59	198	118
Hungary	1 254	71	452	279	3	277	173
Italy	1 131	76	358	142	74	328	152
Ireland	3 006	1 657	365	539	7	293	146
Luxemburg	668	7	269	77	12	211	93
Lithuania	639	3	293	0	44	195	104
Latvia	780	106	306	78	0	188	102
Malta	1 794	1 012	280	174	29	196	103
Norway	3 730	1 972	940	314	0	304	200
The Netherlands	2 520	860	340	872	20	290	137
Portugal	2 118	1 087	577	31	37	250	135
Poland	857	114	374	0	0	232	138
Sweden	1 407	0	407	512	0	310	178
Slovakia	780	13	340	0	0	298	128
Slovenia	1 225	382	347	97	19	255	125

Status: August 2005.

1 Assumption: annual mileage of 15,000 km, consumption of 5.3 l/100 km.

2 Pro-rata on one year calculated from registration taxes and charges.

Sources: ACEA (Association des Constructeurs Européens d'Automobiles, European Automobile Manufacturers Association); ADAC (Allgemeiner Deutscher Automobil-Club e.V., General German Automobile Club); BMF (Bundesministerium der Finanzen, German Federal Ministry of Finance); CEA (Comité européen des assurances, The European Federation of National Insurance Associations); EU Commission; IRF (International Road Federation); calculations done by DIW Berlin.

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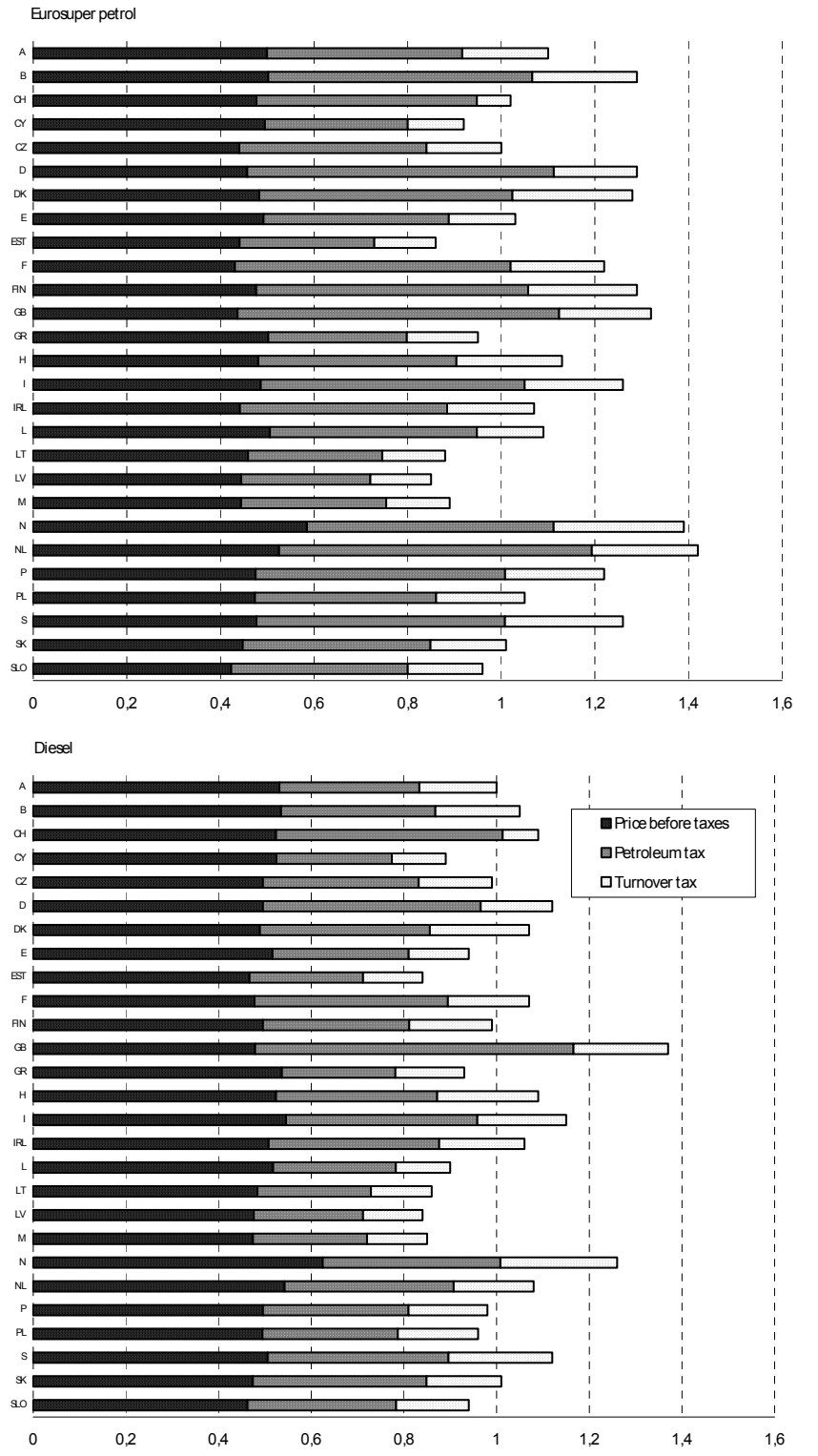
Figure 1

Price components of fuels in Europe
In Euro/ Liter



Status: August 2005.
See Table 1 for country name abbreviations.
Sources: BMF (Bundesministerium der Finanzen, German Federal Ministry of Finance);
EU Commission; calculations done by DIW Berlin.

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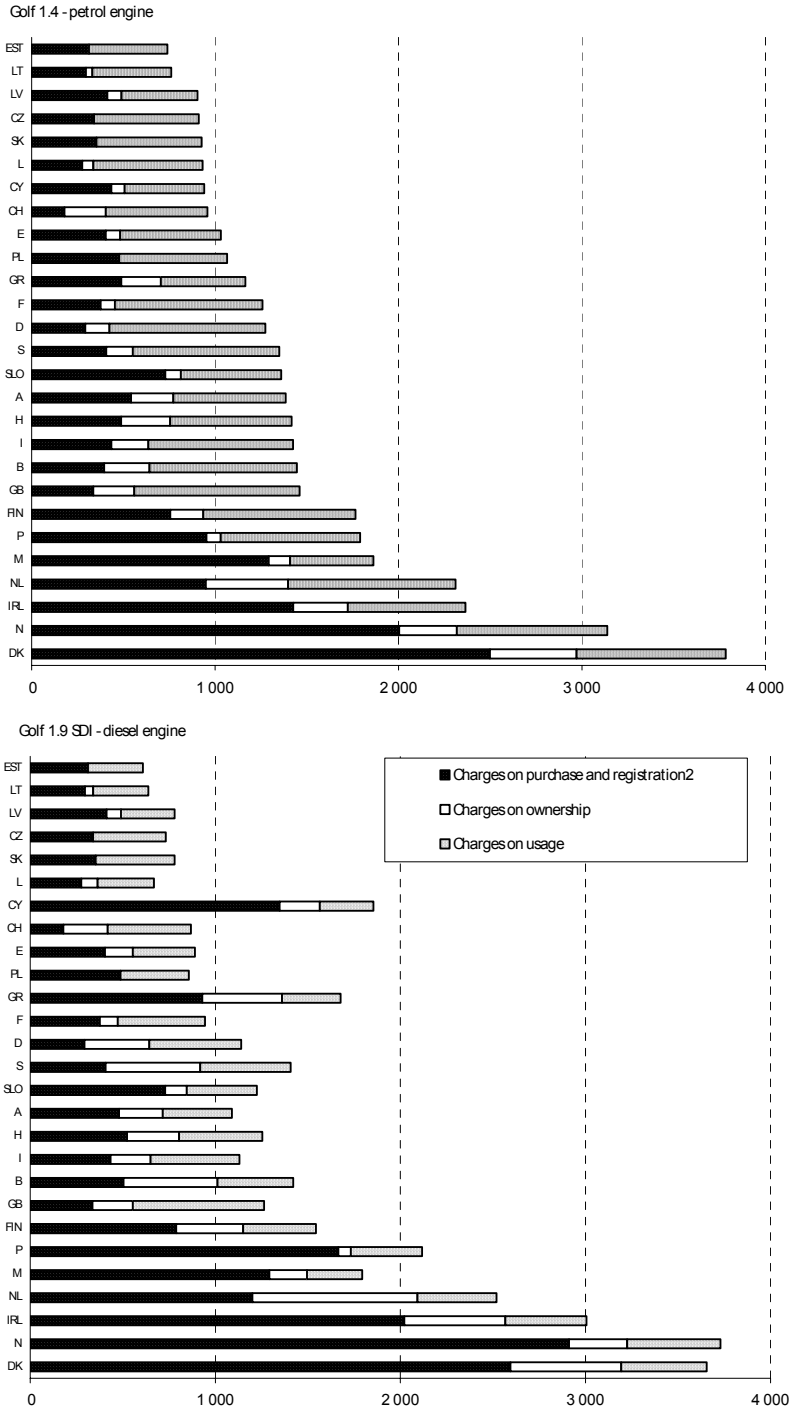
Figure 2

Charges on lower medium class cars in Europe[1]
In Euro/ Year



Status: August 2005.

See Table 1 for country name abbreviations.

1 Assumptions: annual mileage 15,000 km; consumption petrol engine 6.8 l/ 100 km, diesel engine 5.3 l/ 100 km.

2 Pro-rata on one year.

Sources: ACEA (Association des Constructeurs Européens d'Automobiles, European Automobile Manufacturers Association); ADAC (Allgemeiner Deutscher Automobil-Club e.V., General German Automobile Club); BMF (Bundesministerium der Finanzen, German Federal Ministry of Finance); CEA (Comité européen des assurances, The European Federation of National Insurance Associations); EU Commission; IRF (International Road Federation); calculations done by DIW Berlin.

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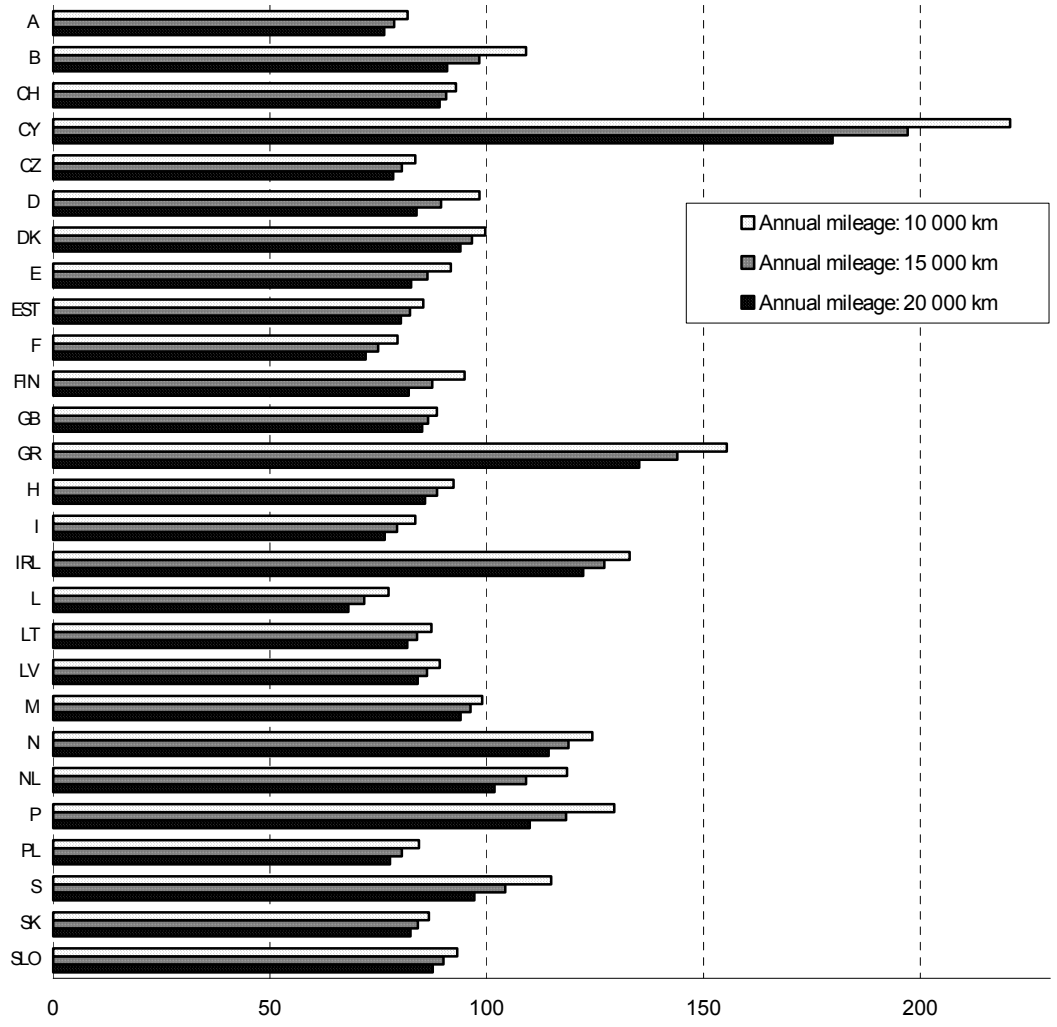
Figure 3

Charges on vehicles with petrol and diesel engines for different annual mileages[1]

Lower medium class: Golf 1.4 with petrol engine as compared to Golf 2.0 SDI with diesel engine
(petrol engine = 100)



Status: August 2005.

See Table 1 for country name abbreviations.

1 Assumptions: Consumption of petrol engine 6.8 l/ 100 km, diesel engine 5,3 l/ 100 km.

Sources: ACEA (Association des Constructeurs Européens d'Automobiles, European Automobile Manufacturers Association); ADAC (Allgemeiner Deutscher Automobil-Club e.V., General German Automobile Club); BMF (Bundesministerium der Finanzen, German Federal Ministry of Finance); CEA (Comité européen des assurances, The European Federation of National Insurance Associations); EU Commission; IRF (International Road Federation); calculations done by DIW Berlin.

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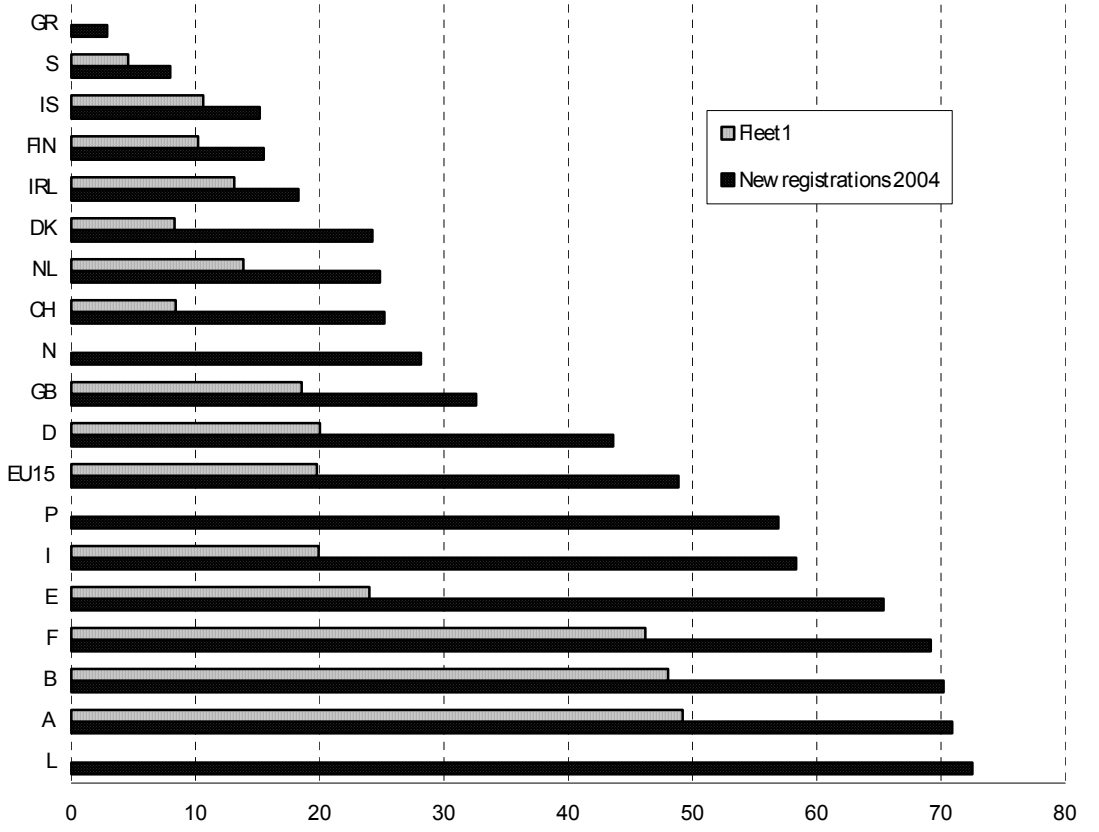
Figure 4

Share of diesel vehicles on the road and in new registration of passenger cars in European countries

In %



See Table 1 for country name abbreviations.

1 Figures as per the information available for the most recent year.

Sources: ACEA (Association des Constructeurs Européens d'Automobiles, European Automobile Manufacturers Association); Eurostat; among others.

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